

**Notice of Allowability**

Application No.

09/726,215

Examiner

Joni Hsu

Applicant(s)

FOULADI ET AL.

Art Unit

2628

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to August 14, 2006.
2. ☒ The allowed claim(s) is/are 1-29, 31-43, 55-76 and 81-84.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some\* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date 8/15/06
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on August 15, 2006 was filed after the mailing date of the application on November 28, 2000. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

### ***Response to Amendment***

2. Applicant's arguments, see page 21, filed August 14, 2006, with respect to Claims 1-29, 31-43, 55-76, and 81-84 have been fully considered and are persuasive. The 35 U.S.C. 103(a) rejections of Claims 1-29, 31-34, 36-43, 55, 56, 59-76, and 81 has been withdrawn.

3. Applicant argues that none of the three applied references discloses storing polygon vertex commands in the manner claimed (page 21).

In reply, the Examiner agrees. Therefore, the rejections have been withdrawn.

## **EXAMINER'S AMENDMENT**

4. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

5. Authorization for this examiner's amendment was given in a telephone interview with Robert W. Faris on December 7, 2006.

The application has been amended as follows:

6. Claim 60 is amended as follows:

"...therein; ~~and~~ generating at least a part of said graphics image based at least in part on the consumed graphics commands and said executed display list; and outputting the generated part of said graphics image to a display."

7. Claims 63, 64, and 66 are amended as follows:

"The ~~graphics system~~ method of claim..."

8. Claims 71-74 are amended as follows:

"The ~~system~~ method of claim 60 further including..."

9. Claim 75 is amended as follows:

"...call; ~~and~~ producing at least a part of a graphics image at least in part in response to the consuming and executing step; and outputting the generated part of said graphics image to a display."

10. Claim 76 is amended as follows:

“...buffer; ~~and~~ generating at least a part of an image at least in part in response to the consumed first set of graphics commands and said display list; and outputting the generated part of said graphics image to a display.”

11. Claim 81 is amended as follows:

“...after consuming the command sequence beginning at the predetermined storage location; wherein the graphics command consumer executes said display list polygon vertex commands to generate at least a part of a graphics image and outputting the generated part of said graphics image to a display.”

*Allowable Subject Matter*

12. Claims 1-29, 31-43, 55-76, and 81-84 are allowed.

The following is an examiner's statement of reasons for allowance:

13. The prior art taken singly or in combination do not teach or suggest a shared memory having plural buffers allocated therein, said plural buffers each receiving and temporarily storing graphics commands output by the producer for delivery to the consumer, at least some of the commands comprising polygon vertex commands, wherein the buffers store inline commands calling display lists comprising further graphics commands including polygon vertex commands for execution by the graphics hardware, the display lists being stored elsewhere in the shared memory; wherein the polygon vertex commands are provided to the pipelined graphics components as per independent claims 1, 32, 36, 37, 55, 60, 75, 76, and 81. Claims 2-29, 31, 33,

34, 38-43, 56, 59, and 61-74 depend from these claims, and therefore are also contain allowable subject matter. Prior art fails to disclose read/write pointers associated with a producer and a consumer involving graphics commands wherein the consumer maintains a write pointer independent of the producer write pointer, and a consumer read pointer that is independent of the producer read pointer; and wherein a configuration command specifies auto-incrementation of the consumer write pointer in response to producer writing to the buffer; producer writing command referencing a second set of graphics elsewhere within a storage device and consumer consuming first set of graphics commands while encountering the referencing command consumes the second set of commands referenced as per independent claims 35, 57 and 58.

Also, prior art fails to disclose wherein in response to encountering the calling command, reading the stored display commands in the display list and responsively generating at least a further portion of said first image in said frame buffer memory; writing additional commands into the same or different memory buffer, said additional commands including at least a second set of graphics commands and at least one calling command that calls the same further, prestored list of display commands; at least some the second set of graphics commands to generate at least a portion of a second image in the same or different frame buffer memory; and reusing said further, stored list of display commands to generate said second image as per independent claim 82. Claims 83 and 84 depend from Claim 82, and therefore also contain allowable subject matter.

14. The closest prior art (McCormack et al. US006112267A) **discloses**: a producer (processor 300, Figure 1a) that outputs graphics commands, a consumer (graphics processor 700, Figure 1a)

that consumes the graphics commands outputted by the producer (processor 300, Figure 1), and a *shared* memory (main memory 200, cache memory 310, off-chip cache 400;...*a processor-memory bus 610 in communication with the main memory 200 and the processor 300; an I/O bus 630 in communication with the I/O device 700*...col; 6, lines 25-30; ...referring to Fig. 1a, the processor 300 generates data to be eventually read by the graphics device 700..the controller 500 and the graphics device 700 cooperate to DMA read data from various locations in the memory hierarchy 200, 310, and 400 ...col.), lines 60-67; col. 8, lines 1-11) coupled between the producer (processor 300, Figure 1) and the consumer (graphics processor 700, Figure 1), the *shared* memory (main memory 200, cache memory 310, off-chip cache 400) storing at least one buffer (third ring buffer 212) receives and temporarily stores graphics commands outputted by the producer (processor 300, Figure 1a) for delivery to the consumer (graphics processor 700, Figure 1) (...the processor 300 generates data to be...read by the graphics device 700...col. 7, lines 60-67), wherein the producer (processor 300, Figure 1a) and the consumer (graphics processor 700, Figure 1) are capable of accessing said buffer (third ring buffer 212) independently of one another (...the processor 300 can write data to buffers 312, 412 or 212...the graphics device 700 can read data from buffers 312, 412 or 212...the dynamic and independent functioning of steps 900 and steps 800 permits...the...writes...and reads...col. 8, lines 5-25). However, McCormack et al. **fails to disclose** wherein said buffers store inline commands calling display lists stored elsewhere in said *shared* memory.

15. Another prior art (Dye US005838334A) **discloses** a display list operation which details pointer manipulations for display list memory buffers (...the windows ID list and the windows

workspace buffer comprise memory areas in the system memory 110 used...the display memory section or buffer includes a plurality of memory areas...and pointers assembled in the display refresh list are used to reference this data...or only the pointers in the display refresh list are manipulated...the term “display memory” as used...is not intended to connote a single frame buffer memory...but rather stores video data for windows or objects in a plurality of respective memory areas...col. 11, lines 30-67; col. 22, lines 15-67; col. 23; lines 1-67). However, Dye **fails to address** polygon vertex commands and wherein inline commands calling display lists comprise further graphics commands for execution by said graphics hardware.

16. Another prior art (Hölzle et al. US006553426B2) **discloses** a function that is external to the routine, and the function, once called, begins executing. Eventually, the function returns to the routine with the function returning to a location in routine that is identified by a normal return address (col. 3, lines 60-67; col. 4, lines 1-5). Hölzle et al. **further discloses** wherein many programs, which include routines, are written such that a program calls “external” functions which may not be included within the program and the functions that are called must eventually return into the routine (col. 1, lines 40-56, Fig. 1). However, Holzle does not teach using out-of-line calls for polygon vertex graphics commands within a display list.

17. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

***Prior Art of Record***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1. McCormack (US006112267A) teaches optimizing memory utilization in the communication between a processor and an input/output device (Col. 1, lines 10-14).
2. Dye (US005838334A) teaches a graphics controller which performs pointer-based display list refresh operations to transfer video data from a memory to a video monitor (Col. 1, lines 18-21).
3. Holzle (US006553426B2) teaches an apparatus for efficiently enabling addresses for multiple return points to be obtained (Col. 1, lines 32-36).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joni Hsu whose telephone number is 571-272-7785. The examiner can normally be reached on M-F 8am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on 571-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JH

  
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SUPERVISORY PATENT EXAMINER